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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,934	12/02/2002	Gary L. Sugar	Cognio6US2	6461

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EXAMINER
LE, DUY K

ART UNIT	PAPER NUMBER
2685	6

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
     closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.
     4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-19* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
     a)☐ All   b)☐ Some * c)☐ None of:
        1.☐ Certified copies of the priority documents have been received.
        2.☐ Certified copies of the priority documents have been received in Application No. _____.
        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
             application from the International Bureau (PCT Rule 17.2(a)). ·
     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
     Paper No(s)/Mail Date *2,3*.

4)☐ Interview Summary (PTO-413)
     Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

DETAILED ACTION

Double Patenting

1.   A rejection based on double patenting of the "same invention" type finds its support in
the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and
useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same
invention," in this context, means an invention drawn to identical subject matter. See *Miller v.
Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957);
and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by
canceling or amending the conflicting claims so they are no longer coextensive in scope. The
filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35
U.S.C. 101.

2.   Claims 1-11 and 19 are rejected under 35 U.S.C. 101 as claiming the same invention as

that of claims 1, 3, 6, and 11-18 of prior U.S. Patent No. 6,526,264. This is a double patenting

rejection.

As to claim 1, the Sugar reference teaches a wideband radio transceiver system for full-

duplex communication of signals associated with one or more wireless communication protocols

operating in a common frequency band (see Col. 10, lines 59-62), the system comprising:

a wideband radio transceiver that detects energy in a frequency band and downconverts

the energy to a low intermediate frequency or baseband signal (see Col. 10, line 66 to Col. 11,

line 2 and Col. 11, lines 8-12), and that upconverts one or more signals to be transmitted in the

frequency band (see Col. 11, lines 53-56);

an analog-to-digital converter (ADC) coupled to the wideband radio transceiver that

converts the low intermediate frequency or baseband signal to a digital receive signal (see Col.

11, lines 3-6);

a receive processing section comprising:

one or more decimators, each associated with a corresponding communication protocol,

and which decimates a corresponding baseband signal derived from the digital receive signal to a

convenient sampling rate for a corresponding communication protocol to generate a complex

baseband signal for each communication protocol (see Col. 11, lines 13-20); and

one more detectors, each associated with a corresponding communication protocol, and

which demodulates a corresponding complex baseband signal to recover data therefrom (see Col.

11, lines 21-25);

a transmit processing section comprising:

one or more modulators, associated with a corresponding communication protocol,

coupled to receive data to be transmitted using the communication protocol, each modulator

generating a complex baseband signal corresponding to a communication protocol (see Col. 11,

lines 28-33);

one or more interpolators, associated with a corresponding communication protocol, each

interpolator increases a sampling rate of a corresponding complex baseband signal output by the

one or more modulators (see Col. 11, lines 34-38); and

one or more upconverters, each associated with a corresponding communication protocol

and which upconverts an output of a corresponding interpolator to generate an intermediate

frequency signal having a desired offset position in the frequency band (see Col. 11, lines 39-

45);

a summer coupled to the output of the upconverters to sum each intermediate frequency

signal output by the upconverter bank to generate a composite intermediate frequency signal (see

Col. 11, lines 46-49); and

a digital-to-analog converter coupled to the summer that converts the composite

intermediate frequency signal to a composite analog signal (see Col. 11, lines 50-52);

wherein the receive processing section and the transmit processing section are operable to

simultaneously process at least one receive signal and at least one transmit signal associated with

one or more communication protocols in the frequency band (see Col. 11, lines 61-65).

As to claim 2, the Sugar reference teaches the system of claim 1, wherein the receive

processing section and the transmit processing section are implemented by one or more digital

application specific and/or general purpose processors that execute firmware or software,

respectively, to process signals as required by each communication protocol (see Col. 12, lines 4-

12).

As to claim 3, the Sugar reference teaches the system of claim 1, wherein the at least one

of each of the decimators, detectors, interpolators, upconverters and modulators are capable of

processing of signals according to one or more of the Bluetooth^{TM} communication protocol and

versions thereof, and the IEEE 802.11 communication protocol and versions thereof (see Col. 12,

lines 28-35).

As to claim 4, the Sugar reference teaches the system of claim 1, and further comprising a

transmit interference canceller coupled between the summer after the outputs of the upconverters

(see Col. 12, lines 50-54), the transmit interference canceller comprising:

a coupled signal path estimator coupled to receive as input the composite intermediate

frequency signal output by the summer, the coupled signal path estimator comprising one or

more of the following elements to operate on the composite intermediate frequency signal: a

multiplier for multiplying the composite intermediate frequency signal by phase and attenuation

factors, a filter having a filter function, a non-linear distortion processing element having a non-linear distortion function, and an adder for adding a complex additive constant (see Col. 12, lines 55-65),

wherein values for the phase and attenuation factors, the filter function, the non-linear distortion function and the complex additive constant being generated using an iterative algorithm to minimize an error signal that is digitized by the analog-to-digital converter in the receive signal path section, and to produce as output a digital signal that represents, at baseband, a transmit signal coupled to the receive signal path, adjusted for one or more of phase, amplitude, frequency distortion, non-linear distortion and carrier leakage/DC offset associated with the coupled signal path (see Col. 12, lines 66 to Col. 13, line 9);

a digital-to-analog converter coupled to the output of the coupled signal path estimator to convert the output thereof to an analog signal (see Col. 13, lines 10-12);

an upconverter coupled to the output of the digital-to-analog converter to upconvert the analog signal to a radio frequency of the receive signal thereby producing a signal that is a replica of the reflected transmit signal (see Col. 13, lines 13-17); and

an adder coupled between the output of the receive antenna and an input to the downconverter in the receive signal path section to subtract the signal output by the upconverter from energy detected by the receive antenna, thereby suppressing the transmit signal that is being transmitted at the same time the receive signal path section is processing one or more receive signals (see Col. 13, lines 18-24).

As to claim 5, the Sugar reference teaches the system of claim 4, and further comprising a processor coupled to receive the error signal and the composite intermediate frequency signal,

and generating values for the phase and attenuation factors, the filter function, the non-linear

distortion function and the complex added constant (see Col. 13, lines 25-30).

As to claim 6, the Sugar reference teaches the system of claim 1, and further comprising a

transmit interference canceller coupled between the summer after the output of the upconverter

bank and an output of the receive antenna (see Col. 13, lines 31-35), the transmit interference

canceller comprising:

a coupled signal path estimator coupled to receive as input the composite intermediate

frequency signal output by the summer, the coupled signal path estimator comprising one or

more of the following elements to operate on the composite intermediate frequency signal: a

multiplier for multiplying the composite intermediate frequency signal by phase and attenuation

factors, a filter having a filter function, a non-linear distortion processing element having a non-

linear distortion function, and an adder for adding a complex additive constant (see Col. 13, lines

36-46),

wherein values for the phase and attenuation factors, the filter function, the non-linear

distortion function and the complex additive constant being generated using an iterative

algorithm to minimize an error signal that is digitized by the analog-to-digital converter in the

receive signal path section, and to produce as output a digital signal that represents, at baseband,

a transmit signal coupled to the receive signal path, adjusted for one or more of phase, amplitude,

frequency distortion, non-linear distortion and carrier leakage/DC offset associated with the

coupled signal path (see Col. 13, lines 47-58);

a digital-to-analog converter coupled to the output of the coupled signal path estimator to

convert the output thereof to an analog signal (see Col. 13, lines 59-61); and

an adder coupled between the output of the downconverter and the input to the analog-to-digital converter in the receive signal path section to subtract the analog signal output by the digital-to-analog converter of the transmit interference canceller from the output of the downconverter, thereby suppressing the transmit signal that is being transmitted at the same time the receive signal path section is processing one or more receive signals (see Col. 13, line 62 to Col. 14, line 3).

As to claim 7, the Sugar reference teaches the system of claim 1, and further comprising:

a coupled signal path estimator coupled to receive as input the composite intermediate frequency signal output by the summer, the signal path estimator comprising one or more of the following elements to operate on the composite intermediate frequency signal: a multiplier for multiplying the composite intermediate frequency signal by phase and attenuation factors, a filter having a filter function, a non-linear distortion processing element having a non-linear distortion function, and an adder for adding a complex additive constant, values for the phase and attenuation factors, the filter function, the non-linear distortion function and the complex additive constant being generated using an iterative algorithm to minimize an error signal that is digitized by the analog-to-digital converter in the receive signal path section (see Col. 14, lines 4-20); and

a predistortion look up table that stores values to predistort the composite intermediate frequency signal output by the summer in order to compensate for non-linear distortion generated by the power amplifier in the transmit signal path section, values for the predistortion look up table being generated to minimize a weighted mean-square distortion between the composite intermediate frequency signal and a signal which is the sum of the output of the

coupled signal path estimator and the output of the analog-to-digital converter in the receive

signal path section (see Col. 14, lines 20-30).

As to claim 8, the Sugar reference teaches the system of claim 7, and further comprising a

processor coupled to receive the signal which is the sum of the output of the coupled signal path

estimator and the output of the analog-to-digital converter in the receive signal path section, and

the composite intermediate frequency signal to generate values for the predistortion look up table

(see Col. 14, lines 31-36).

As to claim 9, the Sugar reference teaches the system of claim 8, wherein the processor

generates values which are weighted so as to provide distortion adjustment across a spectrum

only where energy associated when a transmitted signal exists (see Col. 14, lines 37-40).

As to claim 10, the Sugar reference teaches the system of claim 1, wherein the receive

signal path section processes energy detected by the receive antenna in the frequency band

simultaneously with the transmit signal path section processing signals that are transmitted in the

frequency band (see Col. 14, lines 41-45).

As to claim 11, the Sugar reference teaches the system of claim 1, and further comprising

a transmit carrier suppressor comprising a low pass filter coupled to the output of the analog-to-

digital converter in the receive signal path section and an accumulator coupled to the output of

the low pass filter, the accumulator having a large time constant relative to a transmit packet

duration so as to suppress leakage of energy associated with a transmit carrier, wherein an output

of the accumulator is subtracted from the composite intermediate frequency signal before input

to the digital-to-analog converter in the transmit signal path section (see Col. 14, lines 46-56).

As to claim 19, the Sugar reference teaches the system of claim 1, wherein the transmit

processing section and receive processing section are operable to simultaneously support

multiple channels of the same wireless location area network (WLAN) communication protocol

technology in the frequency band (see Col. 12, lines 28-35. IEEE 802.11 communication

protocol is functionally equivalent to WLAN communication protocol).

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed
> in the United States before the invention by the applicant for patent or (2) a patent granted on an application for
> patent by another filed in the United States before the invention by the applicant for patent, except that an
> international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this
> subsection of an application filed in the United States only if the international application designated the United
> States and was published under Article 21(2) of such treaty in the English language.

4.   Claims 12-14 and 16-17 are rejected under 35 U.S.C. 102(e) as being anticipated by

Cummings (U.S. Patent 6,546,261).

As to claim 12, the Cummings reference teaches a radio transceiver system for

communication of signals associated with one or more wireless communication protocols

occurring in a common frequency band (see Col. 2, lines 36-41), the system comprising:

a radio transceiver that detects energy in a frequency band and downconverts the energy

to a low intermediate frequency or baseband signal (see Col. 9, line 63 to Col. 11, line 3 and Col.

10, lines 12-16), and that upconverts one or more signals to be transmitted in the frequency band

(see Col. 10, lines 29-35); and

a baseband signal processing section (1002, 1008, 1010) coupled to the radio transceiver

that performs baseband demodulation of signals received by the radio transceiver to produce a

plurality of baseband receive signals associated with a corresponding communication protocol

(see Col. 10, lines 36-51 and Figure 11), and that performs baseband modulation of a plurality of

baseband transmit signals associated with a corresponding communication protocol (see Col. 10,

lines 36-51 and Figure 11), wherein the baseband signal processing section is operable to

simultaneously process multiple signals associated with one or more communication protocols

for transmission and/or reception (see Col. 10, lines 36-51, Col. 4, line 64 to Col. 5, line 25,

Figure 11 and 1C. Blocks 42-47 in Figure 1C are functionally equivalent to Blocks 1002, 1008,

1010 in Figure 11 that collectively comprise the baseband signal processing section).

As to claim 13, the Cummings reference teaches a radio system comprising:

a radio receiver (904) that detects energy in a frequency band in which signals of multiple

communication protocol types may be present and downconverts the energy to a low

intermediate frequency or baseband signal (see Col. 9, line 63 to Col. 11, line 3, Col. 10, lines

12-16, and Figure 10); and

an analog to digital converter (1016, 1018) coupled to the radio receiver to convert an

analog signal output by the radio receiver to a digital signal to facilitate analysis of signals in the

frequency band (see Col. 10, lines 36-51 and Figure 11).

As to claim 14, the Cummings reference teaches the system of claim 12, wherein the

baseband signal processing section performs baseband modulation according to a communication

protocol for each of multiple transmit signals for transmission by the radio transceiver in

corresponding frequency channels in the frequency band (see Col. 10, lines 36-51 and Figure

11), and performs baseband demodulation according to the communication protocol of the

baseband signal (see Col. 10, lines 36-51 and Figure 11), to thereby simultaneously support

multiple channels in the frequency band of the same communication protocol (see Col. 10, lines

36-51, Col. 4, line 64 to Col. 5, line 25, Figure 11 and 1C. Blocks 42-47 in Figure 1C are

functionally equivalent to Blocks 1002, 1008, 1010 in Figure 11 that collectively comprise the

baseband signal processing section).

As to claim 16, the Cummings reference teaches a radio transceiver system for

communication of signals occurring in multiple channels in a frequency band (see Col. 2, lines

36-41), the system comprising:

a radio transceiver that downconverts energy in the frequency band including energy in

the multiple channels and produces a baseband receive signal representative thereof (see Col. 9,

line 63 to Col. 11, line 3 and Col. 10, lines 12-16), and that upconverts a plurality of transmit

signals each to be transmitted in a corresponding one of the multiple channels in the frequency

band (see Col. 10, lines 29-35);

an analog to digital converter (ADC) coupled to the radio transceiver that converts the

baseband receive signal to a digital receive signal (see Col. 10, lines 36-51 and Figure 11);

a digital to analog converter (DAC) coupled to the radio transceiver that converts digital

transmit signals to analog transmit signals for upconversion by the radio transceiver (see Col. 10,

lines 36-51 and Figure 11); and

a baseband signal processing section (1002, 1008, 1010) coupled to the ADC and to the

DAC that baseband demodulates the digital receive signal to recover multiple receive data

associated with corresponding channels in the frequency band (see Col. 10, lines 36-51 and

Figure 11) and that modulates multiple transmit data to produce digital transmit signals for

processing by the DAC and transmission by the radio transceiver in corresponding channels in

the frequency band (see Col. 10, lines 36-51 and Figure 11).

As to claim 17, the Cummings reference teaches the system of claim 16, wherein the

baseband signal processing section performs baseband modulation according to a communication

protocol for each of multiple transmit data for transmission by the radio transceiver in

corresponding channels in the frequency band (see Col. 10, lines 36-51 and Figure 11), and

performs baseband demodulation according to the communication protocol of the digital receive

signal representing receive signals for corresponding channels in the frequency band (see Col.

10, lines 36-51 and Figure 11), to thereby simultaneously support multiple channels in the

frequency band of the same communication protocol (see Col. 10, lines 36-51, Col. 4, line 64 to

Col. 5, line 25, Figure 11 and 1C. Blocks 42-47 in Figure 1C are functionally equivalent to

Blocks 1002, 1008, 1010 in Figure 11 that collectively comprise the baseband signal processing

section).

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

6.   Claims 15 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S.

Patent 6,546,261 to Cummings in view of Lemilainen et al. (U.S. Patent 6,766,160).

As to claims 15 and 18, the Cummings reference teaches the system of claims 14 and 17, wherein the baseband signal processing section performs baseband modulation and baseband demodulation to simultaneously support multiple channels of the same communication protocol technology in the frequency band (see Col. 10, lines 36-51, Col. 4, line 64 to Col. 5, line 25, Figure 11 and 1C. Blocks 42-47 in Figure 1C are functionally equivalent to Blocks 1002, 1008, 1010 in Figure 11 that collectively comprise the baseband signal processing section). However, it does not disclose wireless location area network (WLAN) as the communication protocol technology. The Lemilainen reference teaches wireless location area network (WLAN) as the communication protocol technology (see Col. 1, lines 58-65).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the system of Cummings to support the wireless location area network (WLAN) communication protocol technology, as taught by Lemilainen, in order to communicate data over a radio link.

Conclusion

7.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a.   Schwartz et al. (U.S. Patent 6,370,109) discloses CDMA signal power control using quadrature signal calculations.

b.   Gourgue et al. (U.S. Patent 6,400,775) discloses method and a system for digitally linearizing an amplifier.
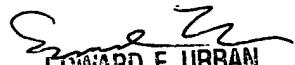
c.   Zhang (U.S. Patent 6,154,641) discloses wideband multiple channel frequency

converter.

8.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Duy K Le whose telephone number is 703-305-5660. The

examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Edward F Urban can be reached on 703-305-4385. The fax phone number for the

organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Duy Le
August 30, 2004

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